

## CLAIMS

What is claimed is:

1. A method for isolating faults in an optical path of an optical network having a plurality of partial regenerators, comprising:
  - transmitting an optical signal through the optical network, the optical signal having error detection data embedded therein;
  - determining an error rate for the optical signal at an egress point of the optical network, where the error rate is based on the error detection data embedded in the optical signal;
  - introducing a dither control signal into the optical signal at two or more of said plurality of partial regenerators; and
  - monitoring the error rate for the optical signal at the egress point of the optical network; thereby isolating where a fault occurs in the optical network.
2. The method of Claim 1 wherein the step of transmitting an optical signal further comprises embedding error detection data in B1 byte of a data frame in accordance with SONET protocol.
3. The method of Claim 1 wherein the step of determining an error rate further comprises calculating Q for the optical signal at the egress point of the optical network.

4. The method of Claim 1 wherein the step of determining an error rate further comprises deriving the error rate from the number of corrected errors in a forward error correction scheme.

5. The method of Claim 1 wherein the step of introducing a dither control signal further comprises introducing the dither control signal at a transmitter in the optical path, thereby assessing if a fault exists downstream from the transmitter.

6. The method of Claim 1 wherein the step of introducing a dither control signal further comprises sequentially introducing the dither control signal at each of said plurality of partial regenerators, thereby assessing if a fault exists downstream from a given partial regenerator.

7. The method of Claim 1 wherein the steps of introducing a dither control signal and monitoring the error rate for the optical signal are performed only when the error rate for the optical signal exceeds a predetermined threshold error rate indicative of a fault in the optical network.

8. A method for isolating faults in an optical path of an optical network having a plurality of partial regenerators, comprising:

transmitting an optical signal through the optical network;

determining a baseline error rate for the optical signal at an egress point of the optical network;

introducing a dither control signal into the optical signal at a first partial regenerator;

determining a first error rate for the optical signal at the egress point of the optical network; and

evaluating the first error rate in relation to the baseline error rate, thereby assessing if a fault exists downstream from the first partial regenerator.

9. The method of Claim 8 further comprising the steps of:

introducing a dither control signal into the optical signal at a transmitter residing in the optical path;

determining a first error rate for the optical signal at the egress point of the optical network; and

evaluating the first error rate in relation to the baseline error rate, thereby assessing if a fault exists downstream from the transmitter.

10. The method of Claim 8 further comprises the steps of:

(a) introducing a dither control signal into the optical signal at a second partial regenerator located downstream from the first partial regenerator;

(b) determining a second error rate for the optical signal at the egress point of the optical network; and

(c) evaluating the second error rate in relation to the baseline error rate, thereby assessing if a fault exists downstream from the second partial regenerator.

11. The method of Claim 10 further comprises repeating steps (a) thru (c) for each of said plurality of partial regenerators in the optical network.